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(52) UK CL (Edition R )

H4P PPA  
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(56) Documents Cited

GB 2326802 A WO 97/38389 A2

(58) Field of Search

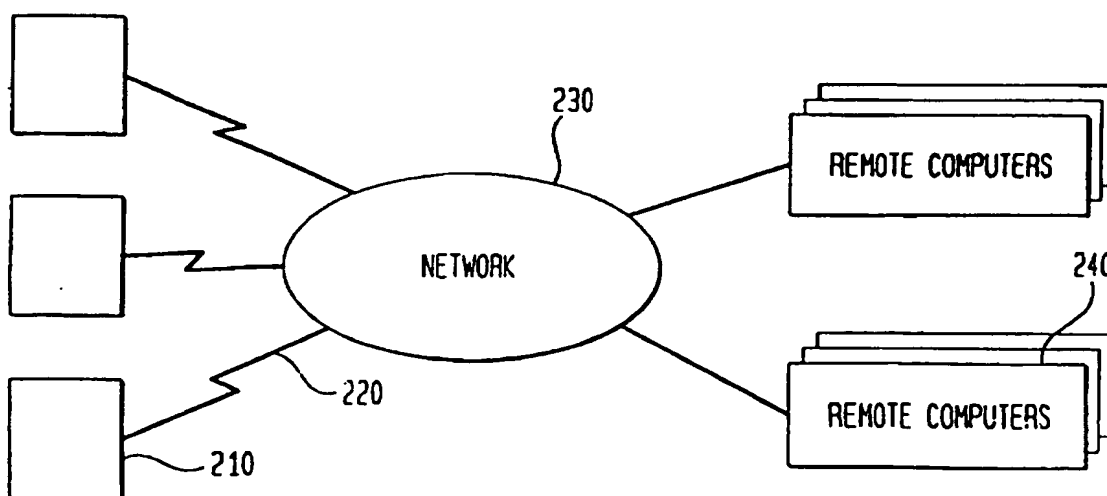
UK CL (Edition R ) H4L LDGX , H4P PPA PPEC PPG PPS  
INT CL<sup>7</sup> G06F 17/30 , H04L 29/06  
Online databases: WPI, EPODOC, JAPIO

(54) Abstract Title

**Delivering customised online services to mobile users**

(57) A mobile end-user selects a number of required services provided by individual service providers and prepares a composite request for these services. The composite request is transmitted to an agent program running on a remote server for execution. The method allows a mobile user to access online services in disconnected mode. In the embodiment the mobile user builds a custom request to fetch a report, print it and deliver it to a third party. The mobile user selects the services of three individual service providers which are offered in the form of eEnvelopes. The mobile user prepares a further eEnvelope containing the selected Envelopes and instructions to and address of a personal enterprise agent on a remote server. The mobile sends the eEnvelope to the agent thus contracting out the administrative and coordination responsibilities.

FIG. 2



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FIG. 1

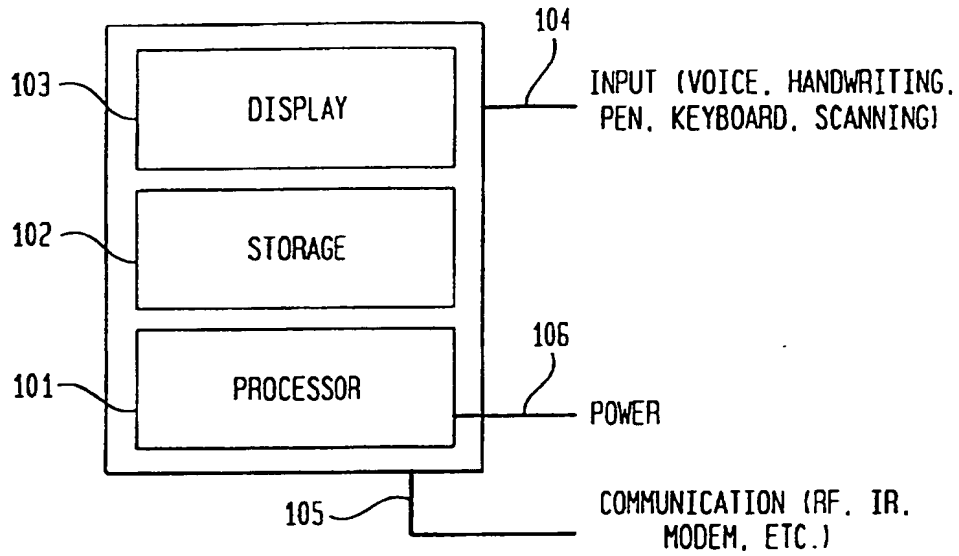


FIG. 2

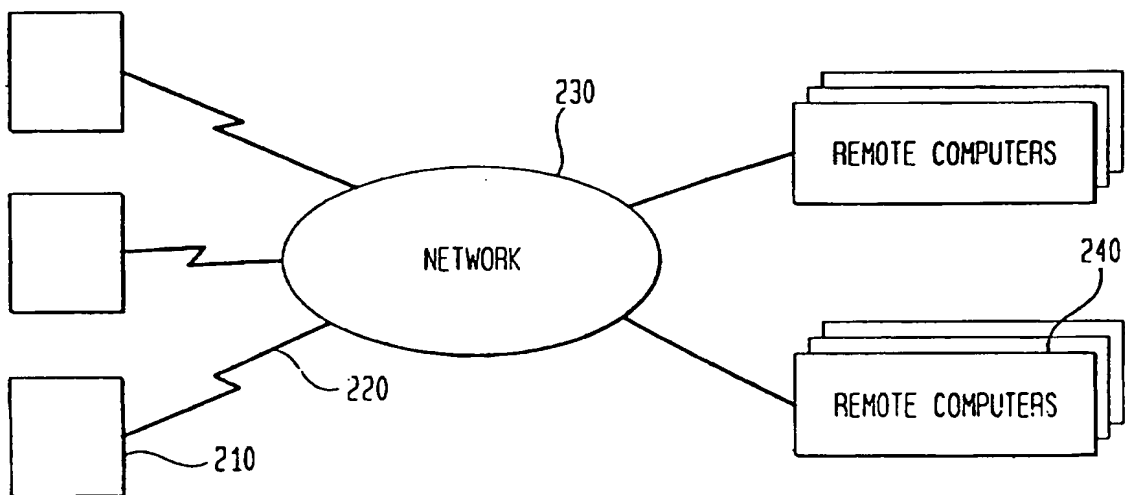
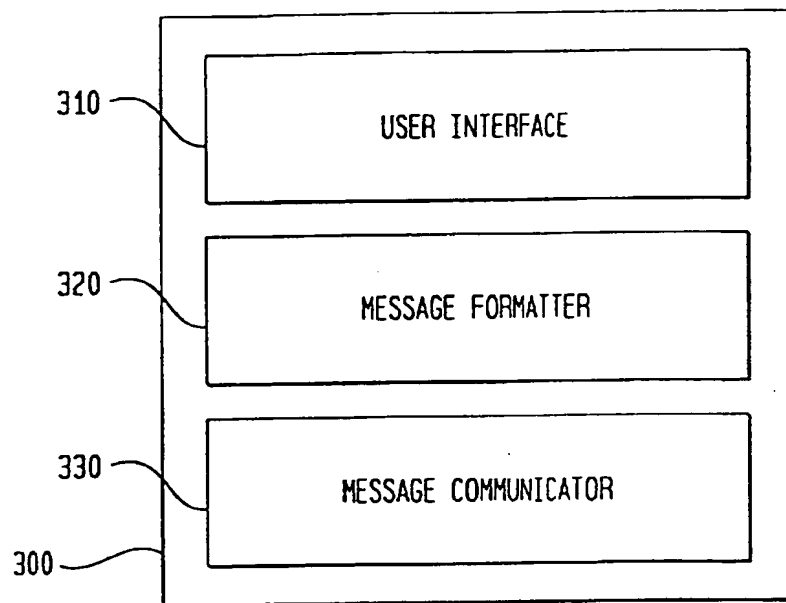


FIG. 3



## A METHOD TO DELIVER SERVICES TO MOBILE USERS

### FIELD OF THE INVENTION

5 The invention relates to the means of delivering online services to mobile users in a pervasive computing environment. In particular, an apparatus and a method for delivering information about services that can be used in disconnected mode to request specific services.

### BACKGROUND

10 The pervasive computing environment is generally understood to involve using mobile devices such as portable computers, pagers, smart phones, personal digital assistants, set top boxes, etc., enabling access to data and services from anywhere at anytime. Mobile devices owe their popularity to their ability of functioning in disconnected mode and to their small size permitting them to be carried anywhere on the person. At present, one can download electronic content and browse it in disconnected mode. It is even possible to fill in any request forms and then connect to submit the completed forms for approval etc. Typically, end-user requirements demand services from more than one enterprise due to reasons including but not limited to, convenience and efficiency. At this point there is no alternative to micro managing interactions with individual enterprises.

### SUMMARY OF THE INVENTION

30 It would, however, be desirable to enable an end-user to custom build a virtual enterprise on a per request basis from existing service providers. This need and its benefits are illustrated by the following example. For instance, assume the existence of the following unrelated enterprises: an information research company KnowledgeStore, a copy and printing services company SuperPrint, and a delivery service OminiDelivery. Further more assume that the above companies offer their services online, and make their menu of services and associated forms in a format suitable for disconnected operation as mentioned earlier. Now the end user builds a custom virtual enterprise that does the following: 1) collect a research report XYZ from KnowledgeStore, 2) print it in both hard-copy format, and 40 35-mm slides at SuperPrint, and 3) deliver them the next day before 10 AM.

Central to the invention is the concept of an electronic envelope (eEnvelope), wherein a structured electronic message is exchanged among entities in a virtual enterprise, similar to the one discussed above. At a minimum, an eEnvelope comprises the following elements: 1) address of sender (electronic or otherwise), 2) address of recipient (electronic or otherwise), and 3) content message. The content message may further include other eEnvelopes.

In terms of the above example, the menu of services/products offered by KnowledgeStore, SuperPrint, and OminiDelivery are available to the mobile user in the form of eEnvelopes. The eEnvelopes could be sent to the user unsolicited as a part of promotional offer, or downloaded by the user as needed. On the mobile device a computer program interprets the electronic message and displays its content to the mobile user both in connected or disconnected mode. For example, in the case of KnowledgeStore the user is shown the types of research reports, and a brief description of each of them. At the end of a selection process an eEnvelope, EV1 comprising of details regarding the report selected, is prepared. The eEnvelopes EV2, and EV3 are similarly prepared, and contain the print options, and the delivery instructions respectively.

In addition EV1 should contain instructions to authorise SuperPrint to obtain the document for printing, and EV2 should contain the credentials to authenticate itself to KnowledgeStore. The exact content and format of the authorisation, and authentication instructions depend on the protocol used. In the same manner, EV2 and EV3 should also have authorisation and authentication instructions.

Now, the virtual enterprise comprising KnowledgeStore, SuperPrint, and OminiDelivery to service this specific request is set up as follows. An eEnvelope EV4 is prepared for this purpose. Among other things, it includes eEnvelopes EV1, EV2, and EV3, and instructions to and the address of a personal enterprise agent (PEA), a computer program, on a remote server. In essence the mobile user is contracting out the administrative and coordination responsibilities of the virtual enterprise to a PEA. It would also be possible to receive bids from a multitude of virtual enterprise agents and choose one.

Thus, there is provided a computer-implemented method for building custom service from services offered by individual service providers comprising of the following steps: selecting required services; preparing a

request eEnvelope comprising of service requests for each individual service provider; building a virtual enterprise eEnvelope from request eEnvelopes; transmitting virtual enterprise eEnvelope to personal enterprise agent for execution; interpreting the eEnvelopes sent by individual service providers; displaying eEnvelope.

#### BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 Shows a basic mobile device

Fig. 2 Shows a block diagram of a simple computer network

Fig. 3 Shows a block diagram of a mobile application

#### DETAILED DESCRIPTION

As shown in Figure 1, a mobile computer is made up of the following hardware components: processor 101, storage 102, display 103, any data input mechanism such as voice, handwriting, pen, keyboard, and others 104, any communication mechanism such as wired or cellular modem, infrared, and others 105 in addition to a power supply 106.

In Figure 2 a plurality of mobile computers 210, are connected by connections 220, to a computer network 230, and thus to a plurality of resources residing on servers 240.

As proposed and illustrated in Figure 3, a typical mobile application 300 consists of three modules: 1) a user interface (UI) 310 module, 2) a message formatter (MF) 320 module, and 3) a message communicator (MC) module 330. The UI is used to gather input from the user and to display output messages to the user. The MF formats user input into messages suitable for transmission over the communication medium, and translates messages received from the communication medium into a format suitable for user presentation. The MC is responsible for sending and receiving messages over the network.

**CLAIMS**

1. A computer-implemented method for building a customised service from services offered electronically by individual service providers comprising the steps of:

selected the required services;

preparing structured electronic request messages from service request offerings from each of a plurality of individual service providers;

interpreting the request messages sent by individual service providers;

building a composite structured electronic request message from said individual structured messages; and

transmitting the composite request message to a personal enterprise agent program on a remote server for execution.

2. A method as claimed in claim 1 comprising the further step of including authorisation of another service provider in a request message from one service provider.

3. A method as claimed in claim 2 comprising the further step of including authentication by a service provider of itself to another service provider in a request message from the first mentioned service provider.

4. A structured electronic message comprising:

the electronic address of the sender;

the electronic address of the recipient; and

an interpretable electronic message.

5. A structured electronic message as claimed in claim 4 further including authorisation of another service provider.

6. A structured electronic message as claimed in claim 5 further including self-authentication to another service provider.



INVESTOR IN PEOPLE

Application No: GB 0001733.5  
Claims searched: 1-3

Examiner: Gareth Griffiths  
Date of search: 4 August 2000

## Patents Act 1977 Search Report under Section 17

### Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:  
UK Cl (Ed.R): H4L (LDGX), H4P (PPA, PPEC, PPG, PPS)  
Int Cl (Ed.7): G06F 17/30, H04L 29/06  
Other: Online Databases: WPI, EPODOC, JAPIO

### Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	GB2326802 A (IBM) p.2 lines 26-40, p.15 para 6 - p.17 para 1	1
A	WO97/38389 A2 (LEXTRON) p.4 lines 19-28	

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.